

Two Case Studies on Electronic Distribution of Government Securities

The U.S. TreasuryDirect System

The Philippine Expanded Small Investors Program

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Abstract: The case study on the US TreasuryDirect examines the evolution of the electronic distribution systems for marketable and nonmarketable government securities, the main objectives and the basic legal infrastructure and the preconditions enabling the system. The U.S. experience highlights that the enabling environment and infrastructure (e.g. in terms of information databases such as Pay.Gov) make a large difference in terms of both the security and convenience that customers can expect in the use of the system. The system also achieved important cost savings for the Bureau of the Public Debt. The case study on the *Small Investors Program* of the Philippines looks at a program that the Philippine government has been experimenting with to sell its securities directly to retail investors over the Internet. The recently revised version of the program—called the Expanded Small Investors Program aims to increase access to government securities and distribute them more widely, develop better savings products, and enhance competition in the primary markets for these securities. This study analyzes whether the program's main goals can be achieved while mitigating the risks. The analysis suggests that there are good reasons to believe that the new program will succeed. Still, regular and responsive assessments and adjustments will be required as the program moves forward.

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Preface

Rapid advances in technology have led many in the development community to examine how it can be used to lower costs and increase access to financial services.¹ The two case studies presented here focus on the issues that arise when government securities are sold directly to small retail investors using electronic channels, especially the Internet. Governments take this approach in hopes of expanding access to financial services and increasing competition among the savings products offered by commercial banks. Such programs can also be designed to improve debt management and develop debt markets, especially in emerging markets.

Although the two models analyzed in these studies—one from the United States, one from the Philippines—differ in many ways, both show how technology can be used to advance debt management policies and foster financial sector development. The case studies also demonstrate the potential of replicating these systems for other services and business models. The carefully developed systems in both countries suggest that although electronic distribution of securities poses risks, there are also enormous potential benefits—making it an avenue worth pursuing.

Why pursue electronic retail distribution of government securities?

Why would governments want to sell their securities directly to retail investors? And why over the Internet? These questions and this approach have close links to three policy areas: debt market development, public debt management, and overall financial sector development. The implications for each are discussed in greater detail in the case studies but are summarized here.

Links to debt market development

Debt market development may be the area most affected by the electronic distribution of government securities to retail investors. The convenience and low cost of using the Internet to sell these securities greatly facilitate development of the retail investor base by providing direct access to a much greater variety of citizens. The Internet also provides a venue for disseminating basic information on government securities, educating investors. Efforts to expand and educate the retail investor base may depend on other reforms in debt markets, however, as well as on the overall level of development and features of a country's securities markets.

The case studies suggest that electronic distribution can increase access to securities, especially in countries where telecommunications, Internet, and cellular infrastructure are growing quickly. But active marketing is essential, especially in remote or disadvantaged areas. With advances in technology, development of the retail investor base can be pursued more actively as an alternative to traditional channels involving the marketing of fixed income funds to such investors, often by financial conglomerates.

¹ See Glaessner, Klingebiel, Claessens, World Bank (2000), (2001), UNCTAD (2002), BIS (2001), OECD (2000)

Beyond this advantage some emerging market government debt offices (e.g., in the Philippines and in Brazil) have also been investigating if such schemes can be deployed in an attempt to distribute securities to foreigners living abroad. Such direct retail distribution of securities electronically in foreign jurisdictions is not straight forward. In most cases the issuer must become a securities broker dealer in the country where such securities are distributed and cannot simply use the foreign bank branch or foreign subsidiary. These costs and other technical problems have made this possibility unattractive.

Links to public debt management

Using electronic channels in the retail distribution of securities provides the issuer—in this case the government—with cost advantages associated with paperless securities. In addition, the government can diversify its investor base, which is usually dominated by banks and other large intermediaries. (Though the extent of this diversification is not yet clear, partly due to the relatively small size of retail investments.) Finally, the case study of the Philippines highlights some other ambitious objectives sought through direct retail distribution of government securities. Among the most important is creating competition for and discipline of primary securities dealers, who often do not adequately “make markets” or help authorities build retail distribution channels.

Links to financial sector development

Electronic distribution increases public access to government securities as an alternative savings product, encouraging savings. This approach could also create competition for financial institutions that offer other savings products (such as deposits or mutual funds) and force them to offer more attractive rates on these. Moreover, this distribution platform can allow for the extraction of critical information about small savers—especially their savings patterns—that can be used by policymakers. Information on previous savings behavior can also be important when making future credit decisions. Finally, though not evident in the cases examined here, such information can help authorities target means-tested subsidies more efficiently.

Developing a credible electronic platform for securities distribution

In building a retail distribution channel, the government first must define its objectives in creating such a system, and how these are consistent with overall policy goals. The case studies highlight the importance of these considerations in determining both the design and the success of such platforms. This process usually requires a thorough understanding of the users of these systems and their needs.

For example, one of the main goals of the U.S. TreasuryDirect system is to make it as easy as possible for the public to learn about Treasury products and services, to make informed decisions about investing in Treasury securities, and to understand how to purchase and hold securities directly with the Treasury. Thus convenience is an essential element of the system’s design, as it will attract investors. Accordingly, the system’s authentication and verification mechanisms allow users to open accounts over the Internet within seconds.

Such mechanisms do not exist in the Philippines. The Expanded Small Investors Program requires investors to appear at a bank branch to open an account. Although this appears to be a deficiency, Philippine investors may not demand the same convenience as U.S. investors—largely because they have few alternatives for investment and savings.

Building an electronic retail distribution channel in emerging markets presents challenges related to public-private cooperation and even suggests a new role for development banks. For example, the Expanded Small Investors Program establishes an interesting new role for a development bank as a neutral third party in the delivery of information technology services to the system. This allows the development bank to use its competitive advantage as a neutral government agency to create a business line for itself and contribute to the system's sustainability.

Finally, the case studies highlight the importance of taking into account the business models for these systems. These business models need to provide incentives for all stakeholders, public and private, to provide services. The business model of the Philippine system is an example of a public-private partnership in which all stakeholders—including the Treasury, commercial banks, software providers, and the Development Bank of the Philippines—have implicit and explicit incentives to take part in the program, contributing to its sustainability.

Meeting essential preconditions

The case studies highlight some of the preconditions for such electronic platforms to work. Confidence in the systems will depend on how well investors are protected. Thus adequate laws and regulations must be in place for transactions to be completed. There should also be little uncertainty about the security, convenience, and speed of transactions.

Electronic security risks are a special concern because these systems tend to rely on open architecture with an Internet backbone. Specific issues in this area are beyond the scope of these case studies (see Glaessner and others 2003). But in general, active approaches are needed to layer e-security and protect against such risks. The case studies examine these risks and how the systems mitigate them. Other infrastructure needed to support such platforms—including dematerialized securities, proper clearing and settlement arrangements, and a functioning payment system—are also described in each study.

The availability of technology and infrastructure also play a vital role in the success of such systems. For example, the cost and availability of Internet access help determine how successful these systems are in reaching the largest possible set of small investors. But especially in developing countries, where some infrastructure is not readily available, it is possible to leapfrog this hurdle by quickly adopting advanced technologies (such as cell phones where land lines are not well-developed) or using innovative models to overcome such deficiencies. Thus these studies refrain from reaching conclusions about the technology and infrastructure needed to implement Internet-based distribution of government securities. Instead, they emphasize that such systems depend on a minimum set of legal and technical infrastructure—and, more important, clear objectives and a well-developed business model that provides adequate incentives for all parties involved.

Case Study 1: The U.S. TreasuryDirect System— Progress and Possibilities in Making Government Securities Available Online²

Introduction

Many countries have been exploring how technology can be used to make the distribution and trading of securities more efficient. Among the approaches being used are electronic auctions of public securities, electronic settlements of transactions, electronic interdealer systems linked to the operations of central banks, and—more recently—electronic distribution of securities directly to retail investors, with banks and brokers playing much smaller roles. This study examines how electronic retail distribution of securities is organized in the United States as part of a broader review³ of worldwide experiences in this area, with special emphasis on its applicability to emerging markets.

The next section describes the U.S. (new) TreasuryDirect and (legacy) *TreasuryDirect* systems, including their products, purpose, and evolution as a distribution channel for government securities. After that the paper describes the various online systems used to distribute U.S. securities and plans for their integration—now under way—under the new TreasuryDirect. The paper then discusses the legal basis for TreasuryDirect, followed by an exploration of crucial issues for electronic security and how these are being addressed. The final section offers lessons for developing electronic distribution systems for government securities.

Products, purpose, and evolution

The U.S. Treasury Department offers two types of debt finance products: marketable securities (including Treasury bills and notes; where a third marketable product, Treasury bonds are not currently being offered) and nonmarketable securities (savings bonds). Until the original *TreasuryDirect* system was introduced in 1986, marketable securities were sold directly to retail investors in paper form at windows in lobbies at Public Debt's Washington office and designated Federal Reserve Banks. *TreasuryDirect* allows all investors to buy electronic marketable securities directly from the government—eliminating many of the costs of intermediation and enabling investors to make investments as small as \$1,000. Investors in marketable securities were required to submit

² *This case study was developed on the basis of a mission of indepth discussions with the Bureau of the Public Debt staff and analysis of the Treasury Direct experience through publicly available information and information provided by the Bureau. The authors of the final report are Thomas Glaessner Lead Financial Economist World Bank, Zeynep Kantur; Financial Economist, World Bank. Written inputs and comments have been provided by Thomas Kellermann, Consultant and Senior Data Risk Management Specialist, Valerie McNevin Consultant and Director of the Homeland Security Initiative for Colorado Institute of Technology, and Yumi Nishiyama, Consultant and Data Risk Management Specialist. The authors wish to thank Elisha Whipkey, Skip Draber, Steve Ehle, Mike Goodwin, Pam Jones, Diane Thomas, and Whitney Tacy of the US Bureau of the Public Debt for extensive support in terms of providing information and comments.*

³ See accompanying case study on the Small Investors' Program in the Philippines, and upcoming paper on "Generic Issues Surrounding Electronic Distribution of Securities"

paper-based tenders until 1997, after which point electronic services were introduced to allow orders to be placed first over the telephone starting in late 1997 and over the Internet starting in June 1998.

The new TreasuryDirect allows investors to open accounts online—without having to submit paper forms—for purchases of two kinds of nonmarketable securities: electronic series EE and I savings bonds. (EE bonds are low-risk products that pay interest based on current market rates on Treasury securities. I bonds track the inflation rate, with investors receiving the accrued interest and principal upon redemption.) The new system is evolving to fully automate customer verification and transactions, and will eventually allow new accounts to be opened online for marketable securities as well. Once that happens, retail sales of both types of securities will be consolidated in the new system and the legacy system (providing electronic services for marketable securities) will be eliminated.

Savings securities have traditionally been viewed as investments for individuals with limited funds (as little as \$25). These securities used to be sold only through financial institutions and payroll savings plans. But in 1999 the Treasury Department introduced Savings Bonds Direct (see the next section), an online service that allowed investors to buy a limited amount of paper savings bonds and pay for them with a credit card. In addition, the new TreasuryDirect system sells electronic versions of savings bonds.

Selling government securities directly to the public helps the government increase public savings through risk-free investments while significantly lowering issuance costs. Using an electronic platform and eliminating intermediaries increase access to securities and widen the investor base. In addition, collecting investors' noncompetitive bids electronically is more efficient for both issuers and investors. It expedites the turnaround time for investors to receive auction results. And by complementing electronic orders with electronic payment systems—such as an automated clearing house (known as ACH, an electronic payment system that transfers authorized funds from investors' accounts to the U.S. Treasury) and credit card-based settlement—the government avoids the costs of paper transactions, including postage expenses, personnel time, and security measures for handling checks and cash. Thus these systems are increasingly moving toward straight-through processing, enabling them to capture all efficiencies at once.

The new TreasuryDirect system has been introduced gradually, and at every stage efforts have been made to cut the costs of retail and wholesale distribution of government securities. Early systems used paper-based confirmations and electronic payments to settle transactions. Then phone-based transactions were introduced, followed by Internet-based transactions. The original paper-based purchasing process involved filling out a tender, indicating the amount of securities wanted, attaching a paper check, and completing other steps that together cost \$12–45 a transaction. By contrast, Internet transactions cost \$0.02 each. In addition, the Treasury Department's agents' personnel costs have dropped significantly, reflecting a sharp reduction in the number of administrative offices (from 37 to 3). Moreover, the Bureau of Public Debt estimates that the department will eventually save \$4–5 million a year on postage costs.

TreasuryDirect mostly targets retail investors, but sales through the system account for a small part of the total demand for debt securities. Between October 2002 and March 2003 U.S. retail sales of these securities totaled \$10.8 billion, with \$5.2 billion for savings bonds and \$5.6 billion for marketable securities sold through the legacy Treasury Direct system. Of the \$5.2 billion for savings

bonds, 63 percent was sold by financial institutions, 23 percent through payroll savings plans, 13 percent through Savings Bonds Direct, and 1 percent through the new TreasuryDirect system. Of the \$5.6 billion in legacy *TreasuryDirect* marketable sales, 55 percent were made by phone, 25 percent on paper, and 20 percent online.

By the end of July 2003 the legacy *TreasuryDirect* system had 500,000 accounts with a total par value of \$66 billion and the new TreasuryDirect had 46,000 accounts with a par value of \$265 million. In July 2003, \$153 million in savings bonds were sold through Savings Bonds Direct.

Types of systems and how they work

At the time of this study the U.S. Treasury Department sold securities through three online systems: the legacy *Treasury Direct* (renamed Electronic Services for Treasury bill, notes and bonds), Savings Bonds Direct and the new TreasuryDirect. Table 1 below summarizes these three systems.

Table 1: Three Online Systems

	The Legacy <i>TreasuryDirect</i>	Savings Bonds Direct	The New TreasuryDirect
Type of securities sold	Marketable Treasury bills, notes, and bonds	Paper I and EE savings bonds	Paperless I and EE savings bonds.
Mechanism for opening accounts and verifying customer identities	Offline	Online – No account	Online
Mechanism for purchase, redemption, and sale of securities	Online and offline	Online – Purchase only	Online
Minimum lot amount/maximum purchase	\$1,000 minimum; all bids in multiples of \$1,000.	\$50, in \$25 increments to \$5,000	\$25, in \$0.01 increments to \$30,000
Payment method	ACH T+1	Credit card T+2	ACH T+1
Fees	Free for accounts less than or equal to \$100,000; \$25 a year for accounts larger than \$100,000; \$34 for each security sold in the secondary market	None	None

LegacyTreasuryDirect system

The original *TreasuryDirect* system was introduced in 1986 and enhanced in 1998, when it became possible for investors to buy Treasury bills, notes, and bonds directly from the government on the Internet or the phone through a program called Buy Direct. Accounts are opened and investor identities verified offline. To open accounts, investors must send in a new account request form or a

Treasury bill, note, and bond tender form, which automatically opens an account. Once they have an account, investors can submit noncompetitive bids for securities over the phone or the Internet, or by filling out paper forms. (Retail investors usually prefer noncompetitive bids, which allow them to buy the full amount of the securities they want at the price determined in the auction.)

An ACH automatically debits purchase amounts from investors' accounts and transfers the funds to the U.S. Treasury. Similarly, interest and principal payments are automatically credited to investors' accounts. The minimum bid is \$1,000, and each bid must be in multiples of \$1,000. The maximum amount allowed for noncompetitive bids is \$1 million for Treasury bills and \$5 million for notes and bonds. The system also allows investors to either automatically reinvest proceeds when securities mature (through Reinvest Direct) or transfer the proceeds to their accounts. Selling government securities before they mature (through Sell Direct) is more complicated. Investors must send a complete [Sell Direct form](#) or [securities transfer form](#) to the Chicago Federal Reserve Bank and pay a fee of \$34 for each security sold. The only other charge involved in investing through *TreasuryDirect* is a \$25 annual account maintenance fee for accounts containing more than \$100,000.

Savings Bonds Direct

Savings Bonds Direct is a system for purchasing paper-based savings bonds. (For more information on savings bonds, see <ftp://ftp.publicdebt.treas.gov/marsbom0602.pdf>.) The system works the same as any online retailer that accepts credit cards. Purchases can be as low as \$50. Investors place orders by completing a purchase request form that includes basic personal information (name, social security number, billing address). The information is transmitted to the Financial Management Service Collection system, which is run by a private firm called Govolution that obtains credit approvals and authorizes transactions while customers are online.

Govolution creates daily batches of all approved transactions and passes them on to Mellon Bank, the U.S. Treasury's merchant bank. The bank debits customers' credit cards and transmits the funds to the Bureau of Public Debt. Customers receive the securities in paper form. Every day the Bureau of Public Debt reconciles the information in its customer service database with the Mellon Bank's deposit files. Of the three online systems, this one is the most costly to administer, because the securities are in paper form and credit card purchases are more expensive than ACH payments. This system will be abandoned at the end of 2003 in favor of the new TreasuryDirect discussed below.

New TreasuryDirect system

The new TreasuryDirect system, introduced in October 2002, is an end-to-end purchase and delivery system for electronic securities. It currently allows investors to buy series EE and I savings bonds for a minimum of \$25. Investors can open accounts online with a Web browser that supports 128-bit encryption. Payments are processed through an ACH, and investors' identities are verified online using the Pay.gov authentication engine. (Pay.gov is an electronic transaction management system run by the Financial Management Service that offers electronic financial services—including access control and customer authentication—to other government agencies.) Investors' personal data are cross-checked across a number of databases to which Pay.gov links. Verification takes about 20 seconds and can be done 24 hours a day, 7 days a week.

Today the system verifies an investor's identity only when an account is opened. But in the future, there are plans to introduce account verifications that will occur when a nonconforming event triggers the system. Once an account is opened, investors can buy securities, manage their accounts, and redeem their investments online. All securities are in electronic form and are transferred to the investor's TreasuryDirect account within one business day of an order being approved. The purchase amount is automatically debited from the designated bank account. The system will eventually offer marketable Treasury securities as well, and replace the multiple systems now in place. The new Treasury Direct is designed to support 80 million accounts, and as of March 2004, had 168,000 accounts.

Legal framework for TreasuryDirect

The legal framework underlying TreasuryDirect involves:

- Laws regulating the issuance and circulation of book-entry Treasury securities eligible to be sold through the system (including provisions allowing dematerialization).
- Laws governing electronic transactions for these securities, including payment systems.
- Laws related to confidentiality and information disclosure.
- Laws and regulations related to e-security. (For a more complete review of legal issues, see Glaessner, McNevin, and Kellermann 2002.)

From a legal perspective, the hierarchy of priorities for TreasuryDirect involve establishing the authority to issue and sell securities, determining the terms and conditions that must be fulfilled to consummate a sale, ensuring the ability to resolve issues of ownership, rights, and responsibilities among the various players with consistent results, and ensuring the ability to protect the process.

Title 31 of the Code of Federal Regulations, titled *Money and Finance*, governs the lifecycle of Treasury securities and TreasuryDirect (see http://www.access.gpo.gov/nara/cfr/waisidx_00/31cfrv2_00.html). Parts [351](#) and [352](#) define the offering terms for and rules governing series EE savings bonds. Parts [359](#) and [360](#) define the offering terms for and rules governing series I savings bonds. Part [363](#) contains the regulations governing securities held in the new TreasuryDirect system. (For a complete list of department circulars under Title 31, see <http://www.publicdebt.treas.gov/sav/savdeptcircular.htm>.)

[Part 356](#), on the sale and issue of marketable book-entry Treasury bills, notes, and bonds, defines book-entry securities, establishes the Treasury's authority to issue and sell such securities, and lays out the rules on denomination, taxation, tenders, offering announcements, and submission of competitive and noncompetitive bids. It defines book-entry securities as those represented by an accounting entry or electronic record, and not by a paper certificate. These are held in either TRADES—a commercial book-entry system—or the legacy *TreasuryDirect* system. In October 2002 holdings in legacy *TreasuryDirect* totaled about \$66 billion or 2 percent of outstanding marketable debt. [Part 356.3](#) sets out the terms and conditions under which the Treasury can sell and issue marketable book-entry bills, notes, and bonds to the public. For *TreasuryDirect*, book-entry securities of account holders are identified and maintained directly in the records of the Bureau of Public Debt.

[Part 357](#), on regulations governing book-entry Treasury bills, notes, and bonds, covers dual book-entry systems, the authority and obligations of the Treasury and Federal Reserve banks, and rules for direct deposits, reinvestment, and handling of transaction requests. Section [357.20](#) sets out rules for securities accounts in the *TreasuryDirect* system, requirements for opening such accounts, and reporting requirements for tax purposes. Section [357.24](#) addresses rules related to the availability and disclosure of *TreasuryDirect* records. Consistent with the U.S. Privacy Act of 1974 (section 552a, on records maintained on individuals; see <http://www.usdoj.gov/04foia/privstat.htm>), these records are confidential and can be released only to designated entities under certain circumstances. These entities include the owners of securities or, in special cases, administrators, legal representatives, and survivors for the purposes of investigation, certain other federal and state government agencies, trustees in bankruptcy, and receivers of insolvent individuals' estates.

Part 370 sets out regulations governing electronic transactions and funds transfers related to government securities. Of particular importance for TreasuryDirect, the rule provides for the use of ACH debit entries for the sale of marketable securities and savings bonds. The provisions in Part 370 are the most important for investors. The provisions govern each step of the business process, laying out the terms and conditions that investors agree to when they purchase electronically issued securities. A few areas of Part 370 are worth noting:

Section 370.1 defines important terms. In particular, it distinguishes between an electronic signature and a digital signature. This distinction is important because the type of e-signature used affects issues of liability and burdens of proof.

Section 370.15 is an example of risk shifting. It provides that the Treasury does not have to verify the identification or authorization of a signature. So, if it receives an electronic entry, it may act on that entry without incurring any liability. But section 370.35 states that the Bureau of the Public Debt will not accept an e-signature unless it is generated using a method approved by the Treasury.

Section 370.36 establishes that a transaction request becomes effective when an electronic message is received in Parkersburg, West Virginia. The law usually states that a transaction is effective when it is sent or received. But this section states that no matter where an electronic message is initiated or where it travels, it becomes effective only when it is received in Parkersburg. Thus investors have no control over the effectiveness of transactions, because once a message is sent they must rely on the telecommunications system to transmit it.

Sections 370.7 and 370.8 are examples of presumptions built into the law. In 370.7, if a financial institution initiates a change order, the Treasury does not have to verify it and the initiating institution indemnifies both the Treasury and the investor for any resulting loss. Section 370.8 states that if a financial institution fails to respond within a set timeframe to a pre-notification entry, the institution warrants that the information in the entry is correct.

The terms and conditions in Part 370 show how the law is changing to accommodate technology rather than using technology to affirm established law. It also shows how risk and liability are being shifted to investors. The proposition is that if investors want to transact business

electronically, they must assume the accompanying risk. In addition, Sections 370.46 and 47 emphasize the fluid nature of the electronic world. Section 370.46 states that the Bureau of Public Debt may waive all the provisions in Part 370 at its discretion. Section 370.47 states that any aspect of these regulations can be changed at any time without notice. It specifically provides that investors assume the risk of change without notice and in particular that it may terminate a provision that was favorable to investors and that nothing in this part creates vested rights for investors in their favor.

[Part 210](#) establishes regulations for federal government participation in ACH transactions. It provides definitions, identifies agencies involved in ACH payments and their liabilities, and defines rules governing authorizations. This part also sets out rules for paper-check conversion. Federal Reserve [ACH Operating Circular 4](#) and its appendices govern the clearing and settlement of commercial ACH credit and debit items by Federal Reserve banks, sending banks, and receiving banks. Government ACH items are included in appendix D of the circular. The circular also discusses the National Automated Clearing House Association, which governs interbank clearing of electronic entries for participating financial institutions.

Part 210 also addresses issues relating to electronic signatures. To facilitate the consistent use and acceptance of e-signatures by executive agencies, Part 210 adopts the definition of e-signatures set out in the 1998 Government Paperwork Elimination Act. Thus it defines an e-signature as a signature of an electronic message that identifies and authenticates a particular person as the source of the message and that indicates that person's approval of the information contained in the message.

Crucial issues for e-security

Although technological advances offer many advantages for the financial services industry, they also herald a world that is shifting from person-to-person interactions and paper transactions toward fully digital, remote access transactions. Moreover, the same technological advances that enable new, more efficient ways of doing business are also responsible for a constant increase in reported vulnerabilities. Given these twin developments, it is critical to implement the most robust security measures, policies, and procedures possible.

As system risks are inherent in every network system, proper risk mitigation is integral to maximizing the safety and soundness of U.S. TreasuryDirect. Among the strengths of the new TreasuryDirect system is the use of the Pay.Gov database that relies on several information databases to verify customer identification. However, this might be harder to replicate in emerging markets due to lack of reliable informational databases in most of these countries.

The TreasuryDirect's network system relies on five key security mechanisms: firewalls, intrusion detection systems (IDS), password authentication, Secure socket layer (SSL), and the annual GAO e-security audits. It is important to understand the strengths and weaknesses of each of these mechanisms.

Glaessner, Nevin and Kellermann (2002) developed a risk management framework for understanding the trade-offs and risks inherent in electronic security infrastructures. A main conclusion is that the efforts to mitigate e-security risks should not be overly reliant on any single security mechanism. Instead, layered security systems should be used.

Lessons for developing electronic distribution systems for government securities

This study provides interesting lessons for other countries interested in designing and implementing electronic distribution systems for government securities. These lessons fall under three categories: the main goals in creating such systems, the various design elements that help achieve those goals, and the preconditions required for such systems to succeed.

Main goals

The first step in creating an electronic distribution system for government securities is to clearly identify the system's goals—because these goals will have a profound effect on how the system is designed. The two main goals in creating the U.S. TreasuryDirect system were to make it as easy as possible for the public to purchase and hold securities directly with Treasury (especially in the form of risk-free assets) and to empower them to directly participate in their government's borrowing program.

Achieving the first objective depends on four criteria: what percentage of the general public the system is able to reach, how convenient and easy it is to use the system, whether the system is perceived as being trustworthy, and whether the returns from direct purchases of securities compare favorably with those from other savings products. The first three criteria are significantly affected by the scheme's overall design. For the fourth, one of the main benefits from the direct distribution of securities is that it eliminates intermediation costs. As a result investors achieve higher returns using legacy *TreasuryDirect*, and will continue to do so when marketable securities are offered in the new TreasuryDirect, than they would if they invested in the same securities using a broker. Historically, returns on deposits and money market mutual funds have also been lower than those on Treasury securities, in the latter case due to fund fees (table 2).

Table 2 Average returns on various U.S. savings products, 2002
(percent)

<i>Product</i>	<i>Return</i>
Money market accounts	0.71
1-year certificate of deposit	0.83
5-year certificate of deposit	2.94
Money market mutual funds	0.88
182-day Treasury bill	1.02
5-year Treasury note	3.30
10-year Treasury note	3.97

Sources: Bureau of Public Debt; Banxquote.com; Investment Company Institute, *Mutual Fund Year Book 2002*.

Although reducing costs to the issuer—the Bureau of Public Debt—was not been a primary objective of the legacy *TreasuryDirect* system, the scheme has lowered the costs of issuance in addition to eliminating intermediary costs for investors. With the new TreasuryDirect and the sale of electronic savings bonds, it is expected that Public Debt will gradually reduce the costs of the savings bond program as well. And with recent advances in technology, the costs of establishing electronic

distribution systems for securities are expected to fall substantially in many developed and emerging markets.

Design aspects

When designing such a system, understanding its customer base is crucial to achieving its main goals. Knowing the customer base is important because standards for simplicity and convenience vary by country. In countries where infrastructure is not readily available or is costly to implement, understanding the preferences of customers makes it possible to focus resources and efforts on areas that add the most value.

Given the objectives of the US TreasuryDirect system, the target customer base consists of citizens of all ages and educational backgrounds. Thus a main focus in designing TreasuryDirect has been to make it simple and convenient as well as able to educate the public. The logo of the new TreasuryDirect system is, “It really is that simple!” The Website educates users on the basics of Treasury securities—including the various types available, how and when auctions are conducted, and the basics of investing in these securities. Focus group studies have been conducted to analyze the main preferences of people using the Website and to determine how the system can be adjusted to address those preferences.

Examinations of similar systems in emerging markets make it clear that the nature of the customer base and the program’s main objectives have not always received sufficient attention—resulting in design weaknesses. (See, for example, the accompanying case study on the Expanded Small Investors’ Program in the Philippines.)

It is also important to determine the expected size of the transactions that will go through the system, to anticipate its effects on domestic debt management. In some cases it can be argued that when a large share of outstanding public securities is held by a large number of small investors, the resulting market may be fragmented and illiquid. It is important to anticipate and plan for such side effects. In the United States just 2 percent of marketable government debt securities are being sold through TreasuryDirect. Thus the system has a marginal effect on the overall distribution of debt, but is achieving its target of increasing savings by retail investors.

Preconditions: do plumbing and infrastructure matter?

This study highlights a variety of key preconditions for developing effective electronic distribution channels for government securities. Among the most important are the legal framework, dematerialization of the securities, authentication infrastructure, payments and settlements infrastructure, and e-security measures.

Legal framework. A minimum set of legislation must be in place for the system to work. The legal environment for TreasuryDirect requires laws regulating the securities eligible to be sold through the system (including provisions allowing dematerialization), laws governing electronic transactions for these securities (including payment systems), laws related to confidentiality and information disclosure, and laws and regulations related to e-security. In many emerging markets an additional problem is that there are not enough cases on how disputes involving electronic transactions will be

resolved or sufficient related evidentiary requirements.

Dematerialization of securities. Electronic distribution systems for Treasury securities not only provide a convenient way of increasing citizens' access to these securities, they also enable the issuer to save on the costs of issuing paper securities and to pass these savings on to investors. A large share of these savings come from reduced printing costs, provided that securities sold electronically are dematerialized. In the United States dematerialization is occurring gradually, with some paper nonmarketable securities still being sold until investors get used to paperless securities. In other countries—especially emerging markets, where leapfrogging is more likely—dematerialization of securities can happen more quickly, resulting in larger savings. But in both cases it is crucial to build the legal framework for dematerialization of securities and the electronic systems to facilitate immobilization, dematerialization, and virtual delivery of these securities.

Authentication infrastructure. The TreasuryDirect system, in its efforts to achieve simplicity, convenience, and security, uses various technologies and infrastructure to authenticate and secure information. In this context Pay.gov, which enables the system to link to various databases to verify investor data, is of special importance. Its database contains detailed information that allows for real-time authentication after checking against at least five other databases to verify identity. This infrastructure makes TreasuryDirect more convenient for its users—allowing them to, for example, open accounts without physically visiting a branch. In countries lacking such infrastructure, convenience will likely take a backseat to security concerns. The extent to which such reduced convenience affects the system's success in reaching its target customers will depend on the customers' standards for convenience.

Payments and settlements infrastructure. The existence of the ACH system is one reason TreasuryDirect can be run without large participation by commercial banks. The ACH system automatically debits and credits investor accounts regardless of which bank they use. Participants need only produce evidence of a bank account and be authenticated by Pay.gov—a feature that greatly expedites transactions. But many emerging markets do not have a well-organized ACH at the retail level to facilitate settlement and clearance of payments associated with retail purchases of government securities. Although some ACH and authentication infrastructure may be difficult to replicate, in many emerging markets the more pressing constraints involve vested interests in the banking community. (A companion case study on the Philippines illustrates this problem.) The availability of such infrastructure gives TreasuryDirect flexibility to rely less on banks.

E-security. When building electronic distribution systems for government securities, e-security is often overlooked in favor of cutting costs and increasing convenience. Yet there are grounds for strengthening such mechanisms, because building trust among investors is crucial to the success of these systems. Experience in emerging markets indicates that this issue is especially important to consider during the design phase—because when a government makes securities available over such channels, it is critical that digital assets, funds, and associated messages be secure.

Case Study 2: The Philippine Expanded Small Investors Program— Using Technology to Sell Government Securities to Retail Investors⁴

Executive Summary

Technology has lowered costs and increased access for a range of financial services.⁵ In the Philippines the Expanded Small Investors Program uses technology—as well as public-private partnerships—to cut the government's costs in issuing its securities and to give small investors direct access to them, providing a new savings instrument. The original Small Investors Program, which ran from 1998–2001, used an electronic platform but had features that inconvenienced investors and other program participants. Recognizing the program's shortcomings, the government revised and recently reactivated it—this time using the Internet to sell its securities.

The Philippine experience shows how a simple process can be used for direct retail distribution of government securities with minimal participation by banks and other intermediaries. (Although the program is not as extensive as U.S. Treasury Direct; see the accompanying report for more details.) Thus this paper is relevant for numerous government entities, including ministries of finance, monetary authorities, securities commissions, agencies responsible for information and communications technology, and development banks. The issues discussed are particularly relevant for staff involved in securities issuance, regulation, research, and policymaking.

The three types of lessons that emerge from this study relate to the goals and risks of an electronic securities distribution program, the design features, and the preconditions for an effective, legally viable program trusted by users.

Goals and risks of electronic securities distribution

The Philippine government suffers from large budget deficits and high public debt. Combined, domestic and foreign debt exceed 70 percent of GDP. The government usually meets slightly more than half of its funding requirements through the domestic debt market. The Treasury issues a range of securities with varying terms and maturities, each targeting different segments of the market. Liquidity is concentrated in 5–10 year government bonds that are usually bought and held by banks and tax-exempt institutional investors. Short-term bills account for about a quarter of outstanding securities.

The primary dealing system consists of 40 dealers (banks and non-banks) eligible to participate in auctions of government securities. But the system is highly concentrated: about five of these dealers hold more than half of all securities and often buy more than half of any auctioned. Securities not held

⁴ This case study is based on information obtained during a February 2003 mission to the Philippines. The mission was led by Thomas Glaessner and included Zeynep Kantur and Gamliel Pascual. Thomas Glaessner is Lead Financial Economist and Integrator Unit Head, Zeynep Kantur is Financial Economist, Thomas Kellermann is Senior Data Risk Management Specialist, Valerie McNevin is (former Director of the Homeland Security Initiative for the Colorado Institute of Technology) Senior Financial Specialist, Yumi Nishiyama is Data Risk Management Specialist (all members of the Integrator Unit at the Financial Sector Operations and Policy Department of the World Bank), and Mr. Gamliel Pascual is the Managing Director of Smetrix, A financial Technology Company based in the Philippines. The authors are grateful to the many government authorities, private market participants, and legal authorities who provided time and information.

⁵ See, for example, Claessens, Glaessner, and Klingebiel (2000, 2001). See also Glaessner and others (2003), which describes these issues in the context of South Africa. UNCTAD (2002), BIS (2001), OECD (2000)

in the dealers' accounts are sold to large institutional investors, many of which are public agencies (such as the Social Security System and the Social Service Insurance System).

Clarifying objectives

The Treasury introduced the Small Investors Program in 1998 as a first step toward establishing government securities as the main investment vehicle for Filipino savers. The program was also expected to broaden the retail investor base for securities and reduce the concentration of government debt holdings.

In addition, it was hoped that the program would increase competition both among dealers in primary auctions and in the market for savings products targeted at small investors. In doing so, the program could indirectly discipline securities dealers by creating incentives for more competitive bidding in auctions and increasing pressure for them to sell the securities to retail investors. These two impacts would not be easily achieved at the start of the program, however, given the small volumes expected to go through it. Moreover, dealers were resistant to the program due to its potential for cannibalizing their deposit bases and so reducing their profits. For these and other reasons the original program was suspended in 2001.

Recognizing risks

Though the Expanded Small Investors Program offers potentially large benefits, it also poses significant risks. One is the possibility that fragmentation in the domestic securities market—resulting from a larger portion of debt being held by many small investors—will reduce liquidity in secondary markets. But that would occur only with extremely high demand from retail investors, and at this stage it is difficult to project such demand.

Another concern is the reputation risk that the government faces if the revised program fails. Although the liability structure for program participants has not been clearly defined, any problems will undermine confidence in Treasury securities. These and other risks should be identified now, in the program's early stages, and steps taken to contain them.

Design features of the program

The Expanded Small Investors Program has several features of interest to officials in other emerging markets.

A new role for the Development Bank of the Philippines

One of the key stakeholders in the Expanded Small Investors Program is a state-owned financial institution, the Development Bank of the Philippines. But because state-owned institutions are not as effective and efficient as private institutions in delivering financial services, such a role is not envisioned for the Development Bank. Instead, the bank's Data Center—a wholly owned subsidiary—will be the application service provider and distributor of the program's main software (licensed from a private firm, Smetrix). This role will give the authorities and market participants, including banks and other potential users (such as the Treasury and retail investors), more confidence

in the integrity of the electronic platform. The Development Bank's neutrality puts it in the best position to take on this role.

A business model that provides incentives for all stakeholders

The original Small Investors Program was suspended primarily because of discrepancies in business arrangements and inadequate backup plans for certain functions. For such a program to work, its business model must create a win-win situation for all parties involved, public and private. The program's main stakeholders are the Treasury, retail investors, participating banks, the Development Bank, and the software provider.

The question that should be asked is, why should these parties participate in such a program? The stakeholders that will incur initial costs are the Treasury, participating banks, the Development Bank, and the software provider. The break-even point for these parties (that is, the number of transactions required to generate profits) is fairly low: only about 40 transactions a day. Aside from potential profits, the program provides other incentives for each party to participate.

Use of the Registry of Scripless Securities to register ownership for individual investors

Philippine government securities have been dematerialized since 1996. The Treasury registers ownership of these securities through a secure trading platform connected to the Registry of Scripless Securities. When investors buy securities through dealers, they are registered at the dealer level—exposing investors to risk of default by dealers. But under the Expanded Small Investors Program, securities are registered under each investor's name, eliminating this risk. In many emerging markets this issue is not always clear. Hence such regulations must be reviewed as part of efforts to establish such programs.

Preconditions for a viable program

Four preconditions must be met for this kind of securities distribution system to work.

An effective legal framework

The Philippine government passed the E-Commerce Act in 2000, enabling the use of digital signatures and ensuring the legal enforceability of electronic documents. Although government securities were dematerialized in 1996, the Securities Regulation Code was only recently revised to include provisions on dematerialization. Finally, the Supreme Court has established rules for accepting electronic documents as evidence in court.

Experience with electronic documents is limited, however, and protection of stakeholder rights has not been tested in court. Trust in the Expanded Small Investors Program will increase as it is tested and tried. But at this stage it is important that its policies, procedures, and processes be clearly documented, and that employees be trained in them. Moreover, the framework should be technology neutral to provide flexibility in applying the best and most affordable practices, especially for electronic security.

Strong regulation and supervision

Regulation and supervision will play an important role in ensuring that the program operates securely and reliably and that the rights of its stakeholders—especially retail investors—are protected. The liability structure for different stakeholders has not been clearly defined, however.

The four main bodies involved in overseeing stakeholders are the Central Bank, Treasury (and Ministry of Finance), Securities Exchange Commission, and National Telecommunications Commission. The Central Bank regulates banks, the Treasury oversees securities dealers (many of which are also banks), and the Securities Exchange Commission protects the rights of retail investors (including against electronic fraud). The National Telecommunications Commission should be empowered to oversee Internet services as well as the data storage and related services being provided by the Development Bank. These institutions should have sufficient expertise, initiative, and power to enforce integrity in the Expanded Small Investors Program, and should be able to coordinate among themselves to avoid gray areas. The challenges of regulation and supervision—and the ultimate liability in the event of problems—can be highly complex.

Sufficient telecommunications infrastructure

Telecommunications infrastructure is the backbone of such a system, which depends on Internet and mobile services to reach potential investors. (Though mobile services can be used only to confirm purchases and view accounts, not to make purchases.) The Philippine telecommunications industry has many features common to recently deregulated environments: cumbersome government processes, transitory industry structures, and strong anticompetitive barriers established by a few dominant players in the sector.

These features could make Internet and mobile services less affordable and available, hampering demand for the program. Moreover, this structure may be inconsistent with developing an independent labor force well trained in electronic security. Many large telecommunications providers that also provide the Internet may not have incentives to provide e-security if it makes their services more cumbersome or expensive—despite the reputational risk they face if their systems were compromised by e-fraud. Yet these entities have become the main providers of e-security solutions; hence there are significant conflicts of interest. Finally, service level agreements in the Philippines do not confer much downstream liability on these service providers, so they have little incentive to secure the services they provide in areas such as hosting.

Adequate electronic security

E-security measures are an often neglected but crucial concern when establishing such systems, and should be in place from the outset to avoid any loss of trust. The Expanded Small Investors Program uses a variety of e-security measures. The important point is that in any security system, excessive reliance on any single security technology can create a point of weakness once that technology is compromised. Thus a layered e-security system should be used, with clear accountability established if the system is compromised.

Conclusion—and questions for the future

Because the Expanded Small Investors Program was not functional at the time of this study, it was not possible to judge its success. But lessons from the first Small Investors Program, the intensive thinking that went into the new program's business model, and the system being implemented merit analysis. The new program appears to offer a credible platform for electronically distributing government securities directly to retail investors. Once the program has been operational for a while, a review should be conducted to examine its replicability in other emerging markets. Looking ahead, several questions will need to be answered:

- Does electronic retailing of government securities achieve the government's debt management objectives—that is, broadening the investor base and improving oversight of primary dealers?
- Has the program increased competition among savings products offered by commercial banks?
- Is the demand from investors sufficient to achieve the program's objectives? And is the demand so high that funding operations have become too concentrated in the retail segment (as in Portugal), fragmenting the market and causing a loss in liquidity?
- Could the same platform and concept be used to distribute a wider range of instruments?
- Could the system be used to reach a wider audience, including Filipinos in other countries?
- Could commercial bank involvement in the program be eliminated, as with the TreasuryDirect model in the United States? (The advanced financial and other infrastructure in the United States may be difficult to develop quickly or economically in emerging markets.)

Retail Distribution of Government Securities— Aiding the Development of Public Debt Markets

Programs that support the primary distribution of government securities are crucial for effective public debt management. Many emerging markets face serious challenges in developing such channels. In many of these countries the distribution of government securities is highly concentrated, partly because of policies to establish primary dealer systems and partly because economies are small and financial systems underdeveloped. Complicating matters, some distribution networks are dominated by a few local banks that simply buy and hold these securities.

In the face of such constraints, programs for the direct retail distribution of government securities can help emerging markets develop their public debt markets.⁶ The Philippines introduced such a program, the Small Investors Program, in 1998. Though suspended in 2001, the program was recently revived as the Expanded Small Investors Program. Such programs, and the issues they raise and respond to, trigger several questions:

- What are the main goals of the Philippine program, and how do they fit into the country's overall debt management strategy? Moreover, are all the goals achievable?
- How can technology enable the retail distribution of government debt securities? What risks are involved, and can they be mitigated? Does the design ensure sufficient electronic security?
- What are the prerequisites for success in designing and implementing this type of program and the related technology?
- Who are the main players in such a program? How are public-private partnerships arranged? What are the incentives for each player? What are the break-even points—especially for a treasury—given the investments required and the different sources of savings and revenues?
- What criteria should be used to gauge the success of such programs in economies with limited retail investors and few distribution channels (often just banks)?

This study is aimed primarily at government authorities in the Philippines (mainly the Ministry of Finance and its Bureau of Treasury, both as the issuer of sovereign debt and as a regulator and policymaker) and elsewhere, as well as members of the development finance community interested in learning how technology can improve management of government debt and increase public access to government securities.

As with any analysis of this type, some important provisions should be kept in mind. First, the Expanded Small Investors Program was just being launched when this study was conducted, so the analysis had to rely on data from the original program and tests of the new one. Second, more research is needed on the characteristics of the small investors participating in the program. Such research was beyond the scope of this study.

⁶ By contrast, in industrial countries such as Canada and the United States the main motivations for such systems are to lower the costs of distributing small-value securities and to make it more convenient for investors to buy them, thereby increasing savings.

Economic Environment in the Philippines

Over the past decade the Philippines has made significant progress in establishing a market-oriented economy. But since 1997 annual GDP growth has been moderate, around 5 percent, and inflation has been about 4 percent (figure 1). A growing budget deficit, high interest rates, and poor investment sentiment have constrained economic development, keeping borrowing costs high and putting pressure on the peso (figure 2).

Because a large portion of the deficit is financed by domestic borrowing, it is crucial that the government develop an effective domestic debt management policy and efficient ways to distribute and service its domestic debt at the lowest possible costs. In addition, the increasing budget deficit and rising debt are undermining the government's creditworthiness. Though this is more of a concern for foreign borrowing, it could also lower domestic investment.

Figure 1. GDP growth and inflation in the Philippines, 1997–2002 (In Percentage Points)

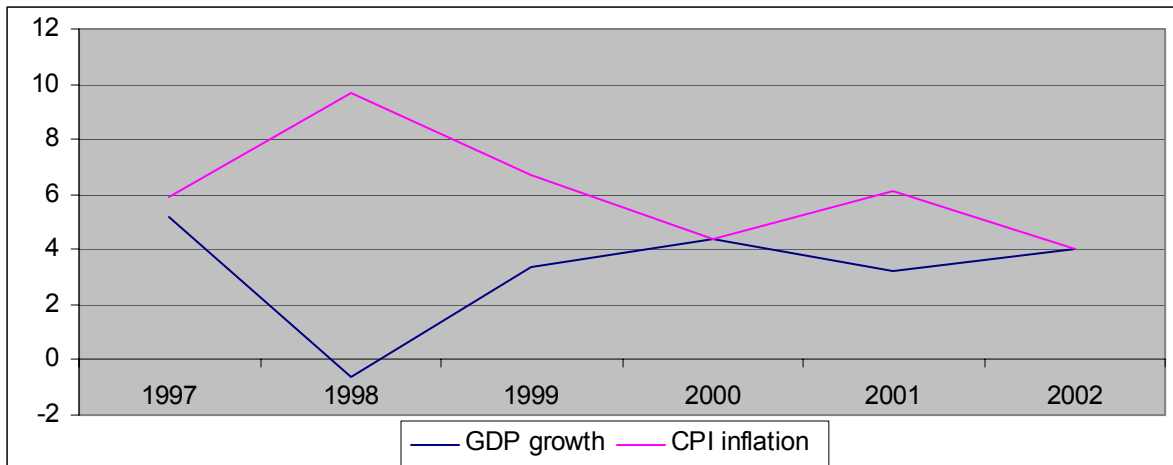
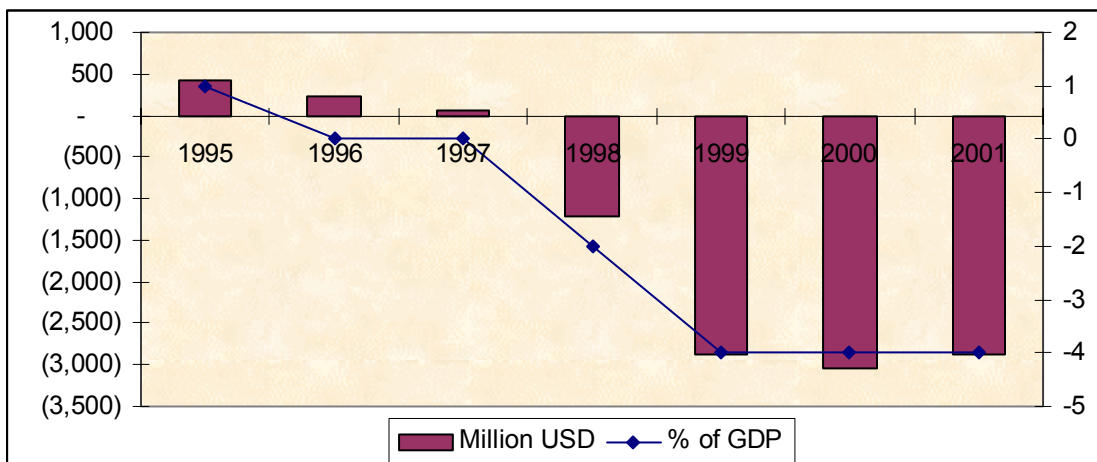


Figure 2. Budget balance in the Philippines, 1995–2001



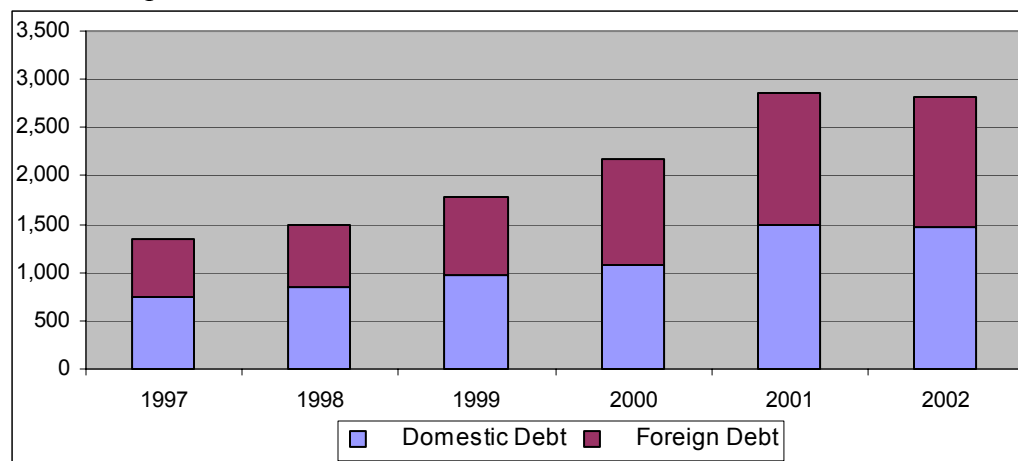
Source: World Bank, *World Development Indicators*, 2002.

The 1997 East Asian financial crisis did less economic damage to the Philippines than to its neighbors. Perhaps as a result, there have been few incentives for systemic financial sector reforms. Capital market development is especially weak, and lags behind other East Asian economies. The government faces major challenges in modernizing its financial sector. Actions are needed to increase the solvency of the banking system and the financial sector more broadly, as well as to streamline legislation and taxation to promote savings and investment.

At the end of 2002 national government debt was quite high: 2.7 trillion pesos (about \$54 billion), or 71 percent of GDP (figure 3). More than half of this was domestic debt. The average maturity for domestic debt was six years, with 60 percent of the outstanding amount having long-term (more than five-year) maturities.

Figure 3. National government debt in the Philippines, 1997–2002

Billions of pesos



Source: Bureau of the Treasury of the Philippines.

The Debt Market, Debt Management, and the Expanded Small Investors Program

This section first provides a snapshot of the local market for government debt, setting the stage for the discussion that follows about the role of the Expanded Small Investors Program.

The government debt market

Peso-denominated government debt has several distinguishing features. First, the government is by far the most active entity in local fixed income markets, accounting for more than 95 percent, or nearly \$18 billion in late 2002 and early 2003 (table 1). Second, the authorities have developed a well-functioning revolving Treasury bill program, with T-bills issued at maturities of 91, 182, and 364 days and most liquidity in the government debt market concentrated in these maturities. Third, the authorities have developed a yield curve—though there is not much liquidity at the longer end of the curve (two years and beyond).

At the same time, as in many other countries, tax-exempt investors have concentrated their purchases in the 2-, 5-, 7-, and 10-year maturities of the local yield curve. Thus the authorities have tried to reduce their refinancing risk and transfer risk to market participants, including dealers of government securities. All interest income on government securities is subject to a 20 percent income tax.

Table 1. Outstanding government securities in the Philippines, August 2002–February 2003
(millions of U.S. dollars)

<i>Type of security</i>	2002					2003	
	<i>Aug</i>	<i>Sept</i>	<i>Oct</i>	<i>Nov</i>	<i>Dec</i>	<i>Jan</i>	<i>Feb</i>
Treasury bills	4,424	4,410	4,513	4,770	4,288	4,426	4,641
91-day	862	1,203	1,353	1,199	639	600	548
182-day	1,222	1,562	1,498	1,826	1,769	1,985	1,968
364-day	2,340	1,645	1,663	1,745	1,880	1,840	2,125
Treasury bonds	13,164	13,148	13,418	13,627	13,569	13,422	13,074
2-year	3,364	3,086	3,208	3,293	3,287	3,070	2,611
3-year	366	607	678	677	671	755	761
4-year	126	148	207	276	273	325	328
5-year	3,837	3,869	3,888	3,951	3,920	4,014	4,048
7-year	2,751	2,734	2,717	2,730	2,741	2,582	2,545
10-year	2,235	2,221	2,226	2,209	2,189	2,189	2,208
20-year	327	326	340	338	335	335	420
25-year	158	157	155	154	152	152	154
Total	17,588	17,558	17,932	18,397	17,856	17,848	17,714

Source: Bureau of the Treasury of the Philippines.

Developments in market infrastructure

Government securities have been dematerialized since 1997, at first through contracts between the Treasury and dealers of government securities. Then, in 2000, the Securities Code and supporting regulations were updated to allow ownership of these securities to be transferred without physical delivery. Subsequently the Treasury created the Registry for Scripless Securities to register uncertified securities and conduct real-time gross settlement of trades in these securities. These developments saved the Treasury considerable time and cost in auctioning and redeeming its securities.

Primary markets

The Treasury sells securities in primary markets in three ways. Auctions are the most common mechanism, with T-bills issued through discriminatory price auctions⁷ conducted every two weeks and T-bonds issued through uniform price auctions⁸ conducted every week. Volumes and tenors are announced a week before each auction. Dealers of government securities participate in these auctions on a competitive basis. The auction process is completely automated, with dealers submitting their bids electronically through the Automated Debt Auction Processing System. The Auction Committee, composed of the representatives of the Treasury, Department of Finance, Securities Exchange Commission, and Central Bank, decides cut-off yields drawing on the submitted bids and the corresponding amount awarded to each bidder.

The second mechanism, the over the counter market, is a negotiated sale window where specific investors—government-owned or -controlled corporations, local government units, and tax-exempt institutions such as pension funds, the Government Social Service Insurance System, the Social Security System, and even insurance companies—can buy securities on a noncompetitive basis. The over the counter market is open every day. For government corporations and local government units, yields are based on the lowest accepted bids in the preceding auction for T-bills or T-bonds; for tax-exempt institutions they are based on the weighted average yields in the preceding auction.

The third mechanism, the tap market, is opened only if the full amount of an auction is not subscribed. Dealers of government securities have exclusive access to this market, with yields based on the lowest accepted bids in the preceding auction.

Dealers of government securities

In recent years the Treasury has liberalized the primary dealership system by opening auctions to more competition. There are currently about 41 dealers (Government Securities Eligible Dealers) (as of December 2003 (GSEDs)) In exchange for exclusive access to primary markets for government securities, these dealers must:

- Have 100 million pesos in an impaired capital and surplus account.
- Meet statutory reserve ratios for their industry (brokerage, banking, and the like).
- Have infrastructure for electronic interactions with the Automated Debt Auction Processing System and the Registry for Scripless securities.

Dealers are not required to maintain minimum participation in primary auctions or provide liquidity to the secondary market. The absence of such requirements may limit access to public securities and encourage dealers to act as investors in the market rather than as entities broadening the distribution network for securities. Moreover, there is no limit on how much of an auction one dealer can purchase, so theoretically one dealer could buy the entire auctioned amount. About five dealers own more than half of outstanding government securities—a concentrated market structure that is cause for concern.

⁷ Successful bidders pay the price that they bid, so not all bidders end up paying the same price.

⁸ All successful dealers pay at the cutoff yield, in line with the uniform price rule.

Holders of government securities

Though there are no detailed statistics on the composition of the holders of government debt, evidence suggests that such holdings are dominated by dealers of government securities and tax-exempt institutional investors. So, even though the Philippines has a population of nearly 80 million people—with more than 10 million living in Manila—the retail investor base is extremely underdeveloped.

Recent debt management initiatives

The government has been taking steps to develop debt markets and improve debt management. Initiatives have included:

- Implementing a reissue program to increase liquidity in segments of the yield curve.
- Reducing the number of and standardizing available debt instruments.
- Lengthening the maturity of domestic debt, thereby reducing refinancing risks.
- Seeking to broaden the retail distribution of government securities through programs such as the small-denominated treasury securities⁹ and the direct distribution of government securities over an electronic platform (all these programs were collectively referred to as the Small Investors' Program, when first launched in 1998).

In addition, efforts have been made to make government debt auctions more transparent and credible, and to introduce mark-to-market requirements for financial institutions (including securities dealers).

The Expanded Small Investors Program and debt management

As noted, the Small Investors Program was launched in 1998 to increase the retail distribution of government securities and empower small investors to use these securities as savings instruments. But the program was suspended in March 2001 due to problems with the service provider and deficiencies in the design of incentives for all stakeholders. Still, at the time of its suspension the program had 2,571 account holders and 1,068 billion pesos in investments. More than 80 percent of transactions within the 5,000–50,000 peso range occurred through the program, and monthly investment averaged 15 million pesos.

The objectives of debt management in the Philippines require a careful balancing of costs and risks, as there are often tradeoffs involved in establishing primary dealers and developing the institutional and retail investor base. In this context the effort to expand the Small Investors Program has several positive features. First, the authorities are using the program to diversify the investor base, on the assumption that retail investors will be less likely than institutional investors and securities dealers to liquidate their holdings in the event of a shock.

⁹ The Small Denominated T-Bills (SDT-Bills) and Small Denominated T-Bonds (SDT-Bonds) were introduced in 1998 and 1999 respectively and are being sold through GSEDs.

Second, the program allows for noncompetitive bidding by small investors, so direct competition with securities dealers is not present in primary auctions. But if this distribution channel becomes more attractive to retail investors than buying securities through banks (because of lower administrative costs), a degree of competition could be introduced. Moreover, this technology could ultimately result in an auction system for distributing securities that avoids the use of banks as intermediaries and distribution agents. The desire to avoid such an outcome would give Philippine banks a strong incentive to make their savings products more competitive. (see table 2) Today, however, banks have few incentives to cannibalize their own base of savings products to promote the Expanded Small Investors Program.

Table 2: A Comparison of Savings Products for Retail Investors*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Electronically distributed						Conventional		
	Primary T-Bill		Secondary T-Bill	TDs	Common Trust Funds		Time Deposits		
	E-SIP			Special Savings Accounts	ST Fixed Income**	Premium Fund**			
Minimum Amount	5,000	100,000	100,000	100,000	100,000	100,000	10,000 - 100,000	> 100,000	> 1,000,000
Gross yield (p.a.)	6.84	6.84	6.38	5.00	6.83	7.31	1.50 - 3.50	1.50 - 3.87	1.875 - 4.25
Processing fee	0.79	0.08							
Brokerage fee	0.50	0.50							
Participation fee									
Investment management fee					0.75	0.75			
Early redemption fee					0.25	0.25			
Minimum holding period				30	30	90	90	90	180
Tenor	91	91	91						
Net yield before taxes	5.55	6.26	6.38	5.00	5.83	6.31	1.50 - 3.50	1.50 - 3.87	1.875 - 4.25

* The table compares the net effective yield after all charges in the case of several savings products available to retail investors in the Philippines.

Sources: Bureau of Treasury web-site, Commercial bank websites.

Potential risks for debt management posed by the program

Potential downside of high demand

By introducing a channel for distributing government securities directly to retail investors, the government risks fragmenting the securities market—by increasing the portion of domestic debt held

by many small investors who buy and hold these securities—and so reducing liquidity in the secondary market. But for that risk to materialize, retail investor demand would have to be very high, accounting for a substantial part of domestic debt. Moreover, holdings of government securities are already concentrated among a few dealers and tax-exempt institutional investors that tend to buy and hold.

The development of the Expanded Small Investors Program has not included a thorough assessment of the retail investor base, which limits the authorities' ability to project demand. Although activity under the original program suggests high demand by retail investors, the amounts were not large. But the old system ran on intranets in bank branches, so its outreach was much smaller than under the enhanced program.

Credibility and risks

Perhaps a more important risk facing the authorities in implementing the Expanded Small Investors Program is the need to build credibility and trust among retail investors. Any problems during the program's early stages will significantly reduce future demand for its services. The program's business model is based on partnerships among public and private bodies, as discussed further below in the section on the program's structure. Although the liability for each party in the event of a system or operational breakdown is unclear, as the issuer of the securities the Treasury will bear the reputation risk.

Issues in gauging success and setting goals

Measuring the program's success and monitoring its progress require clear goals. The program's primary goals include broadening the investor base for government securities and offering a reasonable savings product through bank and development bank branches—but using a common, cheaper electronic platform provided directly by the Treasury.

If the main goal is to diversify holdings of public debt and build the retail investor base, the obvious metric to monitor is growth in the number of new retail accounts and investors. Given the approach being taken with the Registry of Scripless securities—where securities are registered at the investor level—monitoring this growth will be feasible.

Another issue is the program's indirect impact on the financial services industry. The program's indirect objectives include forcing dealers of government securities to compete more in primary auctions and increasing competition among savings products by offering small investors an attractive instrument.

By distributing its securities directly, the Treasury will increase demand for its securities by competing with other savings products for small investors. Savings instruments such as passbook savings accounts yield about 2-3 percent a year, while the Expanded Small Investors Program will offer a yield closer to 6 percent, though not the same liquidity.¹⁰ The yields offered by banks' savings

¹⁰ Under the Expanded Small Investors Program, investors cannot sell their securities before they mature. But it is unlikely that the liquidity premium and associated administration costs of banks amount to more than 300 basis points (3 percent).

products, as well as the transactions and other correspondent fees that banks charge retail investors, could be monitored to measure the program's effect on the market for savings products.

The program could also indirectly discipline dealers of government securities (banks) in terms of increasing client outreach and offering better yields. In addition, it could create incentives for more competitive bidding at primary auctions for government securities and pressure dealers to build distribution channels for selling such securities to retail investors. These two impacts would be difficult to achieve, especially at the start of the program, given the small volume of investment expected to go through it. Moreover, dealers of government securities have shown resistance to the program, most likely due to its potential for cannibalizing their deposit bases and reducing their profitability. Given the system's dependence on bank participation, this resistance could hamper the program's outreach.

Legal and Technical Preconditions for Effective Electronic Distribution of Securities

To work, a system like the Expanded Small Investors Program requires that some key preconditions be in place. Such a system requires that a country have technical infrastructure that enables a fully electronic environment as well as sufficient Internet availability and affordability. It also demands an adequate legal system for conducting such an operation, enforcing best practices in protecting user rights, and (with technical support) protecting against electronic fraud and attacks. The Philippines meets these requirements.

Legal framework

Minimum legal requirements include an e-commerce act that contains laws on e-security and hacking, rules of evidence determined by the supreme court, and legislation enabling dematerialization and virtual transfer of securities. An e-commerce act is fundamental to legalize and enable electronic transactions, enforce electronic documents, and protect such activities from hacking and e-fraud. Business on the Internet is complicating regulators' lives because many do not have jurisdiction over it. The Philippines passed an E-Commerce Act in June 2000. The act makes digital signatures legally binding, promotes universal use of electronic transactions, and introduced anti-hacking provisions.

As a next step, the Supreme Court of the Philippines had to establish rules to interpret the law when judging specific cases. This is a challenging issue because there are not many cases for judges to draw on. The Supreme Court approved rules on electronic evidence in July 2001, laying out procedures for accepting electronic documents as evidence.

Finally, though a law or amendments to the securities law on dematerialization would be preferable, the Philippines addressed dematerialization in 1996 through contracts between the Treasury and dealers of government securities. In addition, in 2000 the Securities Regulation Code was revised to recognize uncertified securities and transfers of such securities.

Regulatory framework

The main regulators for an electronic securities distribution program are those responsible for banking, securities, and telecommunications. These regulators should understand issues related to

electronic transactions and should have adequate powers, initiative, and competence to provide effective oversight of the system. Efforts should focus on protecting retail investors and the overall integrity of the system.

The Central Bank of the Philippines is responsible for supervising banks in terms of providing reliable services and data centers for information storage. Effective monitoring will rest on the processes that the Central Bank requires banks to have in place for ensuring authentication of customers when they open accounts and provide their digital signatures for storage by the Data Center, a wholly owned subsidiary of the Development Bank of the Philippines. The obligations and liabilities of the Development Bank and its supervision by multiple agencies—including the Treasury, National Telecommunications Commission, and Central Bank—will also be important given the bank's critical role as an application service provider and data storage entity.

The Securities Exchange Commission is responsible for regulating dealers of government securities and for promulgating regulations related to electronic securities fraud, which will be essential to the protection of retail investors. As part of such efforts, the commission's capacity to monitor Internet-based securities transactions will need to be improved.

The National Telecommunications Commission needs to ensure that companies provide reliable services, competitive pricing, and adequate security systems. Operating in 11 regions throughout the country, the commission monitors all telecommunications service providers, authorizes rates for public telecommunications services, establishes standards and regulations for telecommunications facilities, and fosters competition in the sector. The commission has deregulated rates to move toward cost-based pricing and has democratized ownership of telecommunications and broadcast services. It is also responsible from registering value-added service providers, such as Internet providers.

Telecommunications infrastructure

Telecommunications infrastructure is a major part of the infrastructure required for the success of the Expanded Small Investors Program. The main issues are the availability and affordability of services such as the Internet and mobile telephones. Over the past 10 years the Philippine telecommunications sector has grown exponentially, with services once available only in Manila and other major cities now covering more remote areas—reaching the point that will enable the Expanded Small Investors Program to reach to most prospective clients. Still, limited competition and weaknesses in the industry's ownership structure pose challenges in terms of the affordability of these services.

Electronic security issues

E-security is a major—and often neglected—concern for systems like the Expanded Small Investors Program. In recent years the incidence and cost of e-fraud and hacking cases have skyrocketed (KPMG Global Information Security Survey 2002, Ernst & Young Global Information Security Survey (2002), 3i White Paper (2002), PWC Information Security Breaches Survey 2002). Any e-security threat could undermine the trust of retail investors and reduce demand.

Efforts to address e-security should consider two tradeoffs. The first is between convenience and risk: as a system becomes more convenient to use, it may become more vulnerable to risks. The second tradeoff is between costs and risks: e-security measures using the latest technology may be extremely costly, especially for emerging markets. Once a system's level of risk has been determined, sustainable resources must be provided to cover it. Among the most crucial is sufficient expertise in e-security software and hardware. E-security is advancing quickly—both in terms of how systems can be attacked and how they can be protected from such attacks. External experts should be hired to assess a system's vulnerabilities, as should in-house security officers at the same level as chief accountants and comptrollers.

How Does the Expanded Program Work?

To purchase securities through the Expanded Small Investors Program, an investor must have a checking account with a participating bank. (Because the Philippines does not have an automated clearing house system, these banks settle transactions under the program.) To open an account, an investor must visit a bank branch and physically and electronically sign the account opening statement. For each account a securities account is created in the Registry of Scripless securities in the investor's name.

The investor can then buy securities over the Internet. Purchases are simultaneously debited from the investor's bank account and credited to the account in the Registry of Scripless Securities. Interest and principal payments are credited to the bank account when due. The system does not allow investors to sell securities before they mature.

This system has different implications for different parties. The Department of Finance, given its difficult fiscal position and heavy dependence on domestic borrowing, would be predisposed to favor initiatives that electronically issue securities directly to investors. This approach could eliminate layers in the workflow and so cut borrowing costs.

For investors, the program is at least as convenient as other online financial services, such as banking or stock trading. Online banking, however, involves the integration of multiple electronic systems that are all owned and controlled by a single legal entity. By contrast, the Expanded Small Investors Program involves shared services. The economic logic of shared services is based primarily on economies of scale. But the program also poses a significant challenge for the Treasury, requiring it to get multiple legal entities to integrate their proprietary electronic systems to deliver services. Thus it is important to understand the entities involved in the program, the roles of their systems, and the electronic links between the systems.

Entities involved

The main entities involved in the Expanded Small Investors Program are:

- Smetrix—the developer and vendor of Document Hub, Gatekeeper, and the program application (e-SIP). Smetrix does not operate these software platforms; it licenses them to the operators of shared services (see below).

- Data Center—the subsidiary of the Development Bank that licenses Smetrix software and is responsible for overseeing the program.
- Participating dealers of government securities and development banks (such as Landbank)—the operators of checking accounts.
- Treasury—the program manager and operator of the Registry of Scripless Securities.

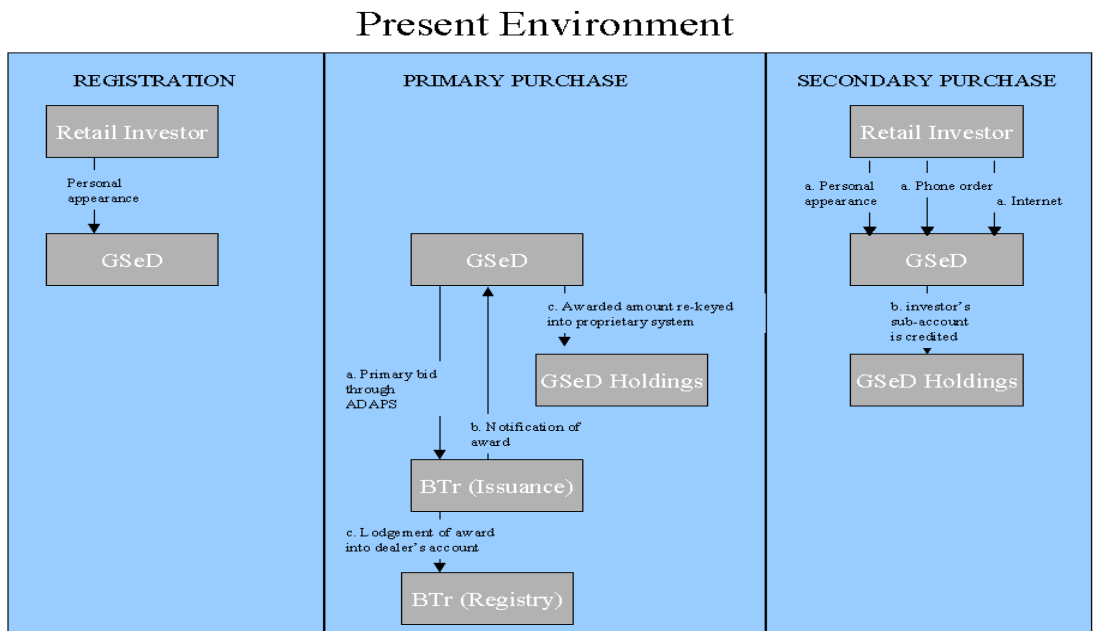
Systems involved

The main systems involved in the Expanded Small Investors Program are:

- Document Hub—a database of digital signatures of customers with accounts at banks (dealers) authorized to sell government securities. This application, used to authorize the creation of investor accounts for the program, is run by the Data Center.
- Program application (GS Direct)—software responsible for opening accounts in the Registry of Scripless Securities (RoSS), taking orders for securities purchases, processing interest and principal payments upon maturity of securities, and confirming transactions by email. This application is run by the Data Center.
- Gatekeeper—a file transfer application located at participating banks (for use with checking account systems, with files received from Document Hub) and the Treasury (for use with the Registry of Scripless Securities, with files transferred from the program application). Gatekeeper is also responsible for issuing confirmations of purchases to investors' mobile telephones.
- Checking accounts—required for investors; operated by participating dealers (banks).
- Registry of Scripless Securities—Treasury entity responsible for registering government securities and maintaining investor accounts.

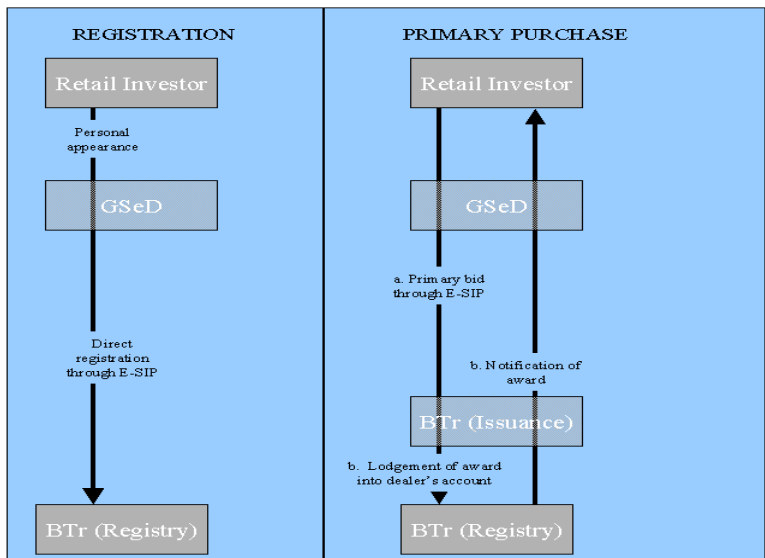
The streamlined processes introduced by the Expanded Small Investors Program are reflected in figures 4 and 5, which compare old and new arrangements for retail purchases of government securities. The biggest change is that the program exposes retail investors directly to the primary market; previously they were relegated to the secondary market. In addition, the old setup relied on roundabout processes that involved a lot of duplication and data reentry, with no synchronization between the Registry of Scripless Securities and the holdings of securities dealers. The new system addresses these discrepancies.

Figure 4. Process for retail purchases of securities before the Expanded Small Investors Program



Source: SMetrix

Figure 5. Process for retail purchases of securities under the Expanded Small Investors Program
E- SIP Environment



Source: SMetrix

The differences between the old and new arrangements are summarized in table 3.

Table 3. Distribution framework for government securities before and after the Expanded Small Investors Program

Before	After
<i>Primary market</i>	
<ul style="list-style-type: none"> Only authorized securities dealers (banks) and large, tax-exempt institutional investors (such as pension funds) were allowed to participate in auctions of securities 	<ul style="list-style-type: none"> Noncompetitive pricing; retail investors acquire securities for the most recent average auction price less 50 basis points (0.5 percent)
<ul style="list-style-type: none"> Dealers distributed securities through a subset of their branch networks 	<ul style="list-style-type: none"> Nationwide
<ul style="list-style-type: none"> Only large market participants (institutional investors and dealers (GSEDs)) had accounts in the Registry of Scripless Securities 	<ul style="list-style-type: none"> Retail investors open individual accounts in the registry
<ul style="list-style-type: none"> Minimum investment through dealers (GSEDs) is 100,000 pesos, and not in the primary markets. 	<ul style="list-style-type: none"> Minimum investment is 5,000 pesos
	<ul style="list-style-type: none"> Unlimited supply of securities
<i>Secondary market</i>	
<ul style="list-style-type: none"> Dealer and customer accounts were combined 	
<ul style="list-style-type: none"> Minimum investment was 100,000 pesos through dealers in secondary markets 	
<ul style="list-style-type: none"> Supply of securities for distribution in secondary markets depended on availability 	
<ul style="list-style-type: none"> Prices varied according to the spreads charged by dealers 	

Although the new process does not eliminate dealers, they are no longer able to determine spreads or control access to government securities. Under the old arrangements dealers chose their technology and determined their workflows, then imposed these on the Treasury. But with the Expanded Small Investors Program, the Development Bank's Data Center has been transformed into a shared services provider that connects investors, dealers, and the Treasury. Thus the power for determining efficiencies has been shifted to the Treasury.

What Incentives Does the Expanded Program Offer Stakeholders?

The Expanded Small Investors Program uses an interesting business model that involves a variety of public-private partnerships. Explicit incentives for stakeholders encourage participation while supporting the program's policy goals. Stakeholders include the Treasury (issuer of government securities), retail investors, the Data Center (applications service provider), participating banks

(dealers), Smetrix (software developer), and the Securities Exchange Commission. The program's business plan aims to ensure that all stakeholders receive benefits that outweigh their costs.

Treasury

The Treasury has the strongest incentives of any stakeholder, ranging from achieving lower costs to promulgating best practices through debt management policy.

Incentives

Increased access and distribution. With an electronic direct retailing platform, the Treasury can provide direct retail participation in the government securities marketplace. Previously the Treasury relied on dealers to develop a deep, liquid retail market for government securities.

Cheaper operations. Dealers are not required to conduct backroom operations when distributing securities under the Expanded Small Investors Program. Between the program application and the Registry of Scripless Securities, backroom functions such as investor accounting and custody, statement rendition, and maturities processing are performed for each dealer. The Gatekeeper software is especially useful because it allows dealers to enter their demand deposit systems with little or no modification. With little upfront costs for banks, it is easier—as well as faster—for the Treasury to bring them into the program.

In addition, the Treasury can fully leverage the capabilities of the Registry of Scripless Securities and pass the savings on to investors, because the registry's efficiencies—resulting from its real-time processing environment—are directly linked to the program's retailing system. And because the program was designed to be as paperless as regulations allow, the delivery cost is lower than what private financial institutions are able to deliver.

Better dealer management and discipline. The Expanded Small Investors Program, by providing an alternative channel for distributing government securities, is expected to increase the Treasury's ability to impose higher standards on dealers. First, the program can serve as an important check on the auction process. In 2002, the Treasury has rejected several primary bids in the belief that they were not in line with prevailing market conditions. Because the program is essentially a noncompetitive window for retail investors, the Treasury hypothesizes that with enough participants, dealers will avoid having too wide a spread between their bid rates for T-Bills and their yields on bank liability products—because doing so would encourage customers to switch from deposits to the Expanded Small Investors Program.

Second, because the Treasury has acquired the capacity to provide an almost painless environment for dealers to participate in the program, it theoretically has also acquired leverage to pressure dealers to build bona fide retail channels. Moreover, the Treasury can now quantify the efforts of securities dealers because it knows exactly how many retail investors they have enrolled. This capability makes it reasonable for the Treasury to impose investor quotas and targets as part of its criteria for rating dealers.

Finally, the Treasury could pressure dealers to carry all its products. From a logistical standpoint, the Treasury could argue that it has provided efficient and cost-effective securities custody and delivery facilities. In exchange, dealers should demonstrate their ability to attract investors for different sections of the Treasury's maturity spectrum.

Zero investment cost. Aside from contributing connectivity to the Registry of Scripless Securities, the Treasury did not have to make any hard investments to acquire an e-business platform comparable with private offerings. Smetrix took the entrepreneurial risk in building the platform and partnered with the Data Center to provide it to the Treasury.

Ability to offer all retail government securities. The Expanded Small Investors Program provides a platform for the Treasury to offer all retail government security products. The Retail Treasury Bond program is currently offered to retail investors through firm underwriting. By offering the bonds through the program on a similar noncompetitive basis, the Treasury could generate savings by eliminating underwriting fees.

Investor education. Philippine regulators have had a hard time suppressing financial scams. The Expanded Small Investors Program provides an opportunity for the Treasury to expose new or less sophisticated investors to such essential issues as market risk and differences between bank deposit products and fixed income securities and between registry and book-entry recording of ownership, as well as to increase investor expectations in terms of risk and reward propositions.

Increased investor expectations for service and convenience. The real-time nature of the Expanded Small Investors Program and the provision of transactions and information over the Internet will give investors new levels of convenience and service. Until now government investment services in the Philippines have been unable to match the convenience of private services.

Expanded savings mobilization. The 1998 launch of the Small Investors Program made the Treasury aware of the program's ability to attract participants even among those without bank services. The expanded program will offer a product for retail investment that directly competes with other investment products, such as deposits and mutual funds. And given the program's better rates, it should attract investor attention away from products with unattractive yields, as well as pressure the market to be more innovative in offering savings products—which will translate into increased savings.

Investor protection. Registration in the Registry of Scripless Securities occurs at the investor level. This will protect investors from dealer failures and closures because ownership records will be maintained directly by the Treasury.

Risks

Reputation risk arising from service disruptions. As with the original Small Investors Program, the Treasury is fully dependent on the performance of the service provider, in this case the Development Bank of the Philippines and its Data Center. The Treasury has experience handling catastrophic disruption and is using lessons from the original program. For its part, the Data Center has sought to reassure the Treasury by negotiating the escrow of the program's source code from Smetrix.

Liquidity risk. The Treasury plans to offer both Treasury bills and notes on the electronic platform. (At first only bills will be offered.) To avoid skewed maturity profiles, a carefully crafted online issuance strategy has to be developed.

Dependence on the sales and promotion efforts of dealers. The Treasury is dependent on the sales and promotion efforts of the dealers involved in the program. Given the program's major benefits for the Treasury, it should consider creating a promotions budget that drives interested investors into dealer offices.

Retail investors

Incentives

Better access to savings products. The Expanded Small Investors Program is especially useful in providing access to savings instruments in areas of the Philippines outside the three main cities (Manila, Cebu, Davao), because bank branches in these areas do not carry the full range of deposit and investment products.

More choices and better yields. If Treasury notes are made available as well, it would be possible for investors to construct their own portfolios using a variety of savings products. These could be used for different needs, such as education plans, pensions, and provident savings, and could provide alternatives to under performing products.

With the program's low delivery costs and direct access to retail investors, the Treasury has an opportunity to realign Treasury yields relative to private debt instrument yields. Currently, inefficiencies in the distribution of securities sometimes result in private debt instruments being placed in the hands of savers and investors at yields far below those for Treasury securities with similar maturities. These misalignments are sustained for extended periods simply because investors lack choices, especially outside major urban areas.

Risks

The main implicit cost for investors buying government securities through the Expanded Small Investors Program is the liquidity constraint due to the program's buy and hold nature. If investors purchase these securities through dealers, they will be able to redeem them before maturity (with a certain capital gain or loss). But under the program, securities cannot be sold before maturity except in extraordinary situations.

Data Center

Incentives

New profit streams beyond the Development Bank. Although the Data Center is organized as a profit center, it is operating at break-even levels and depends on revenue from performing operations and maintenance services for Development Bank banking systems. The Data Center's partnership with Smetrix will enable it to earn fees from opening accounts and processing purchase orders.

Risks

Licensing fees. The Data Center has to pay an annual license fee of 600,000 pesos to operate Document Hub and the interdependent applications (such as the program application) that run on top of it. The Data Center also shoulders co-location expenses for Document Hub. But these are minimal because the platform is covered by three desktop servers.

Dependence on the sales and promotion effort of dealers. Like the Treasury, the Data Center is dependent on volume and on the sales and promotion efforts of the Development Bank and other banks in their roles as securities dealers.

Participating Banks (Dealers)

Incentives

Distribution fee income. Because the Expanded Small Investors Program is essentially a turnkey program for which the bulk of the technology development has already been done, dealers stand to enjoy high profit margins. The Participating banks are offered these margins (50 basis points, or 0.5 percent, for each transaction), although the program was conceptualized as being highly automated with little need for manual interventions or reliance on paper to initiate or confirm transactions. The "clean" nature of the fee income should command the attention of banks' senior management, especially those responsible for managing risk and allocating capital.

Increase in customers. A private bank involved in the Treasury's Retail Treasury Bond program experienced substantial gains in investors, so other dealers participating in Treasury programs should experience similar effects. These customers may come from nonparticipating dealers or from the unbanked sector.

Liquidity outlet. The Expanded Small Investors Program may allow banks to manage their excess liquidity by redirecting some toward the program and earning distribution fee income.

Risks

Annual rental of Gatekeeper. The sole hard costs for dealers are renting the Gatekeeper license (350,000 pesos a year) and buying hardware to run it on. Break-even levels are quite modest. At the same time, attracting new investors should be easy, especially among bank customers. Many potential investors are already active in bank liability products such as savings accounts or time deposits.

Increased loan funding costs. As in other developing countries, most Philippine commercial banks rely on cheap deposits and match these against corporate and consumer loans. The banks have not made much headway in squeezing efficiencies from their processing infrastructure and are often motivated to skew the array of products sold through branches toward bank liability products rather than Treasury bills. By participating in the Expanded Small Investors Program, they might face some cannibalization of their deposit products.

Sales and promotional expenses. Dealers have to incur a certain amount of sales and promotional expenses to generate awareness. Though difficult to quantify, there is reason to believe that these expenses can be contained thanks to previous experience with the Small Investors Program. In 1998 radio and press releases generated consistent interest and participation from retail investors.

Training. There are soft costs associated with training bank personnel to explain the program to investors and open accounts. But the program is designed to take advantage of existing resources, and personnel staffing new accounts desks will be used to perform these functions.

Smetrix

Incentives

Transaction processing fees. By assisting the Data Center with critical e-business capabilities, Smetrix is able to swap its upfront development and hardware expenses for a share of transaction processing income. The relatively fixed nature of the upfront expenses could translate into attractive payoffs for what are essentially entrepreneurial risks if volumes meet expectations.

Strategic partnership with the Data Center. The program's success should raise expectations that there is now a mechanism that can deliver increasing automation for business to business and business to government initiatives. Smetrix, together with the Data Center, can leverage a successful program implementation and pursue similar infrastructure projects that require multiple private-public partnerships. For example, the infrastructure concept could be used to ensure efficient, transparent processing of customs import and export documents.

Risks

Software development costs. The direct development costs associated with Document Hub and its interdependent applications are about 20 million pesos. Additional hardware and software licensing costs total 300,000 pesos.

Dependence on the sales and promotion efforts of dealers. Smetrix is dependent on dealers to drive volume through the platform. Apart from revenues from the Expanded Small Investors Program, heavy volume will make other organizations more likely to entrust their e-business initiatives to Smetrix.

How Are Business Risks Being Mitigated?

As a financial services institution, the Treasury has unique experience when it comes to shared services. The chronic national budget deficit has deprived the government of resources to pursue a proprietary automation agenda. Given its limited budget, the Treasury has had to focus on a single critical mission: creating the Registry for Scripless Securities, and outsourcing remaining operations to private providers. This strategy can be regarded as a variant of privatization. Privatization is often pursued to increase efficiency, but the Treasury's goal is to overcome budget constraints.

A downside to this strategy was that the Treasury has undergone business interruptions—such as the termination of the Small Investors Program in 1998—as a result of its shared services approach. Thus it has developed its own risk management approach so that systems can be back up if private service providers back out.

For clarity, the discussion of risks in this section deals with those specific to this variant of the shared services strategy. Hence the sections below often discuss operational risks that have had to be addressed under the Expanded Small Investors Program and related technology.

Operational continuity of the Registry of Scripless Securities

The unreliability of funding for annual expenditures does not permit the Treasury to switch to a fully digital process. There is no “mirror” server in the Registry of Scripless Securities that can immediately take over if the primary server fails. The contingency plan is to revert to manual processes while registry operations are restored.

Backups of data and printouts of investor holdings and outstanding securities are maintained on a daily basis. In addition, accounting staff, facsimile machines, and telephones support the operations in the Treasury operations center.

The Registry of Scripless Securities (RoSS) provides registry and custody services for institutional investors and dealers that translate into about 3,000 accounts. This could balloon into several hundred thousand accounts by the time the program reaches full maturity in the next two years after the program becomes operational. Although the Treasury has upgraded the registry to hold up to 1 million individual accounts, it has had no occasion to stress test at maximum levels.

Partner interdependency

The operations of the Expanded Small Investors Program require the availability of multiple systems. Because these systems are not under the control of the Treasury, the Treasury depends on the operational and security policies and procedures of its main partners: securities dealers and the Data Center. To foster an environment that ensures predictable services for investors, the Treasury signed

service agreements with dealers and the Data Center. These agreements define a baseline of service quality expectations that should be disclosed to investors, including for system requirements, availability, contingency plans, and schedules for maintenance and upgrades.

Reliance on third-party software

Program applications will require regular maintenance to ensure their proper operation. As part of maintenance, source code must be provided to program participants. The source code for the Registry of Scripless Securities is owned and guarded by the Treasury. Source codes for the program application, Document Hub, and Gatekeeper software are held (in escrow) by the Data Center. All these applications run on Unix and are built on open platform conventions—ensuring maximum flexibility when choosing hardware and software to operate these systems. Participating dealers have varying proficiency in terms of their checking account systems, and not all possess the source codes.

There is a growing trend among software vendors to offer remote administration and maintenance. This option has been popular in the Philippines due to the perceived lower costs. But there have been several cases in the United States where systems have been hacked or manipulated while being remotely maintained. Remote administration is not available for the Registry of Scripless Securities and Smetrix software. Any required maintenance necessitates that the vendor's support personnel visit the relevant office.

Identification, authentication, and authorization

Unlike other retail trading systems where updates to investor holdings are executed on the systems of securities dealers, the Expanded Small Investors Program permits investors to directly acquire and register their holdings on the Registry of Scripless Securities. This approach has legal implications because full title to securities is granted upon registration. Thus strong efforts must be made to avoid erroneous registrations. For electronic purchases transferred to the registry on a straight-through processing basis, risks are concentrated in two areas. The first involves identifying and enrolling investors; the second occurs at the time of purchase.

Compliance with “know thy customer” rules

The Treasury appoints participating dealers as agents to enroll retail investors. The account opening procedure follows standard bank account openings in that the applicant has to appear before the enrolling bank officer and bring suitable identification. The entire application process is done at a bank branch, with the information created and committed on an internal network.

Compliance with “know thy customer” rules is still rooted in physical identification. The Philippines does not have electronic identity databases that would allow banking or investment accounts to be created through electronic verification. Although physical identification may be tedious, it makes it harder to create phantom identities and accounts.

Electronic documents carry all the terms and conditions underpinning the program. These documents are digitally signed by the bank, and copies are stored with the Treasury and the bank. The Treasury needs copies because of its registrar functions, which include acting on ownership-related

issues such as title transfers, inheritance, and pledges. The use of digitally signed applications reduces paper handling and allows the Treasury to be centralized in one physical location.

Completed applications are printed for the applicant and the bank officer to sign, and each receives a copy. Although digital signatures are being used in the program, they are mainly used to facilitate the routing of application forms. There are few concerns about the robustness of digitally signed documents because parties can default to signed hard copies of applications.

This process experienced a disaster when the sole dealer for the original Small Investors Program went out of business in early 2001. Having investor information at the Treasury allowed uninterrupted servicing of investor transactions.

Identity theft

Dealing directly with retail investors through a Web-based delivery channel forces the Treasury to address the possibility that investors' electronic identities will be stolen—causing losses to cash and securities holdings. In response, Smetrix and the Treasury have developed process and workflow controls to augment software and hardware safeguards. The telex funds transfer system has been used as a model of an electronic system that relies on an open network to transmit high-value transactions. Because telex transfers are inherently unsafe, the banking industry has developed robust operating procedures to provide protection.

As noted, investor profiles are created over an intranet that securely links e-SIP platform with the Gatekeeper software at dealers and the Registry of Scripless Securities. The main motivation for this approach is that the intranet offers a “clean” environment with high confidence that malicious manipulations of identity data have been blocked.

Each investor selects a username and password for the system. Every time investors submit purchases, they only need to key in their usernames and passwords to identify themselves. The system then identifies the investor using a unique alphanumeric code based on the investor's bank account and securities registration account. (These identifier codes are permanently set in the systems maintained by dealers and the Registry of Scripless Securities, and cannot be changed. Bank and registry accounts are never shown or required on the Web form.)

This identifier code is then passed on to the gatekeepers (dealers or the Registry of Scripless Securities) along with the details of the purchase. The gatekeepers scan their records if see if there is a match for it. If there is, the transaction is translated into the data format required by the target system. Thus authorization of the transaction is performed onsite by the gatekeepers.

In the physical world, risks of collusion within financial institutions have been addressed by using internal audit teams to constantly monitor transactions and verify them with bank customers. Among the main tools used are independent tracers sent to customers asking them to acknowledge the accuracy and completeness of bank records. The dilemma for Web-based financial services is that email verifications of transactions could be compromised. In addition, the speed of electronic processing implies that criminals may be long gone by the time independent tracers are sent out.

Smetrix decided to address this issue using the cellular phone networks that have achieved major penetration in the Philippines. Moreover, the gatekeepers will send text confirmations directly to the cell phones of investors using Short Messaging Services (SMS). Thus investors have independent confirmation loops that can be validated against details sent by email and through the browser.

Even if a hacker were able to break into the program's database and manipulate a securities account or bank account, he or she would have no control over the messages being sent to the investor alerting the investor on changes in her account. Therefore, the investor will automatically be alerted through her cell phone that an unauthorized transaction has been done on her account.

Regulatory and compliance risk

Independent verification and authorization by the gatekeepers allows the Treasury and banks to comply with regulations while enabling the realization of straight-through processing. This nuance is important because under Philippine banking laws, responsibility for authorization lies with the bank—and questions arise if approval processes occur outside it.

Third-party payments

Because investor identifier codes are permanently committed to Gatekeeper investor profiles, third-party payments (or delivery free of payment) are not possible. An investor's holdings can only be in cash (in a checking account) or near cash (securities in a registry account). In other words, there is no redemption window at the Treasury. This "closed loop" environment means that cash flows just move back and forth between the locked-down accounts for purchases and maturities processing. Thus an investor's entry and exit from the Expanded Small Investors Program occurs through the teller of the participating dealer (bank).

Settlement risk

The entire purchase and settlement cycle is to be completed within a one-minute window (including SMS confirmation messages). For all intents and purposes this is real-time implementation of payment and delivery. But in fact, the Treasury insists on payment before delivery. So, in processing a purchase transaction, an investor's checking account is debited before a new T-bill is credited into the investor's registry account.

The reason for this is that legal ownership of the T-bill occurs at the point of issuance, and the Treasury has no way to reverse ownership in the event of errors. In banks, misposted transactions are not uncommon, and the fungibility of money does not confer legal title to an account holder if an account receives erroneous transfers of money.

Conclusions

The Expanded Small Investors Program shows how a government, using appropriate technology and well-developed business arrangements between public and private entities, can distribute its securities directly to its citizens. Looking ahead, this experiment raises questions for the

authorities in improving the system or enlarging its mandate:

- Will the demand from retail investors be sufficient to achieve the program's objectives? There has not been a formal survey of the demand for such a product. It is assumed that time deposit account holders will be the main users of the Expanded Small Investors Program. This assumption relies on another, stronger assumption: that small investors are rational and will switch to better investment options when they become available. But that may not be true. An investor survey or focus group could be used to measure demand, and a marketing campaign may be required to draw attention to the system and educate investors. The Treasury will be responsible for such efforts.
- With the infrastructure in place, could the system be used to distribute a wider range of instruments—starting with other government securities and eventually moving to private securities? Although the program offers only Treasury bills, there are plans to include all retail government securities and longer-term bonds.
- There are no technological limits on such a system. All limits imposed are related to policy or legal concerns, such as the ceiling on the amount that can be purchased in each transaction and the system's buy-and-hold nature. Are these limits needed, or could they be removed to make the program more attractive?
- Is there a need to distinguish between institutional and retail investors for government securities? Although the system of securities dealers helps create markets for these securities and facilitates their distribution, do the dealers' functions justify their privileges?
- Could the Expanded Small Investors Program be offered to offshore Filipino investors? Doing so would require exploring laws in foreign countries that could block such investments, as well as registration procedures, money laundering concerns, and many other issues. But such an exploration might be worthwhile if it increases the demand for the program.
- Could telecommunications technology be used to expand the program's outreach? In the Philippines mobile phone use is increasing much faster than Internet use. The program currently uses mobile phone technology only to confirm purchases. But if this technology were fully exploited, it could be used to purchase securities. Such an expansion would require sufficient exploration of other concerns for e-security.

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